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I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of any patent issued thereon.

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CABLE CONNECTOR

The present invention relates to a cable connector in the form of a housing made up of at least two components which may be moved to come into contact with each other about an axis of rotation for electrically conducting connection of a flat cable having a plurality of conductors in the form of bunched conductors with at least one round cable also having a plurality of conductors in the form of bunched conductors, with a housing upper component for reception of the bared conductors of the round cable with the insulation removed, laterally separated from each other in the connection section provided inside the upper component of the housing, and having a housing lower component for reception of the flat cable, and with electrically conducting contacting elements on which the conductors of the round cable may be connected and which are provided with cutting tips for perforation of the conductor insulating materials and embedding in the strands of the conductors of the flat cable.

One such cable connector, in which the multiple-conductor cables to be connected to each other preferably are configured as flat cables on one side and as round cables on the other, has been described in PCT Application WO 03/021721.

In this disclosed cable connector the contacting elements are contained in an intermediate component forming a part of the housing upper component. The contacting elements have cutting tips extending both downward and upward, so that connection of the two cables is effected automatically by compression of the housing components. Relatively high force must be applied in order to carry out the closing process with the required degree of certainty, regardless of whether the cutting tips of the contacting elements are to be pressed into both cables or into only one of them.

The object of this invention accordingly is to eliminate this disadvantage and provide means making it possible to close the cable connector in a simple and cost-effective manner.

It is claimed for the invention that this object is attained with a cable connector as defined in the foregoing having the characteristics specified in the characterizing part of claim 1.

Specific embodiments of the cable connector claimed for the invention are defined in the dependent claims.

The invention will be described in greater detail on the basis of exemplary embodiments illustrated in the drawing, in which

- FIG. 1 presents a section in the form of a diagram through a cable connector claimed for the invention;
- FIG. 2 a top view of the cable connector shown in FIG. 1;
- FIG. 3 another view of the cable connector shown in FIG. 1, with a side of the U-shaped closing lever shown in detail; and
- FIG. 4 a diagram of a section through an alternative embodiment of a cable connector claimed for the invention.

The housing-shaped cable connector shown in FIGS. 1 to 3 has a housing upper component 1 and housing lower component 2 which may be moved relative to each other about an axis of rotation positioned on the left side. The cable connector performs the function of connecting in a simple manner the conductors of a round cable 3 to the conductors of a flat cable 4.

The individual bared conductors 3' of the round cable 3, which is held at the entrance to housing upper component 1 by means of shackle 5, 5', are connected to conducting contacting elements 6 (by means of clamps 7 and screws 8).

The contacting elements 6 associated with the individual conductors 3' have cutting tips 6' pointing downward which, when the two housing components 1, 2 are moved together,

automatically penetrate the insulations and are embedded in the bunched conductors 4' of the flat cable 4 and establish the electric connection desired.

In order that the forces required for moving the housing components completely together may be applied, a closing lever 9 is coupled to the housing upper component 1 as the core of this invention. The lever 9 is configured to be U-shaped and each side of the U is coupled to a side of the housing upper component 1.

Each side of the U is provided with a closing claw 10 which acts in conjunction with an associated cam 11 on opposite sides of housing lower component 2 so that when the lever 9 is thrown, the two housing components are pressed (and retained) against each other and the cutting tips 6' are pressed into the bunched conductors 4' of the flat cable 4 without special application of force.

FIG. 4 of the drawing presents a diagram of an alternative embodiment of the cable connector claimed for the invention. The substantial difference is represented by the circumstance that there is associated with the housing upper component 1 an additional intermediate component 1' which performs the function of retaining the contacting elements 6.

The latter have cutting tips 6' and 6" projecting both downward and upward.

The individual bared conductors 3' of the round cable 3, are engaged by the upper cutting tips 6" without baring of the individual conductors 3' when the connector is closed and electric connection is thereby established (as is the case with the lower cutting tips 6', which penetrate the bunched conductors 4' of the flat cable). The closing lever 9 essential for the invention is provided in this instance as well for closing the cable connector.